

Weekly Report

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05.16.2016 - 05.22.2016

Projects

Visual SVM

This week I have embedded the 3D Isomap view into the system. Figure 1 shows the current version of the interface, including A) the linear projection view, B) Isomap projection of support vectors on 2-D plane, C) Isomap projection in a 3-D space with classification probabilities, and D) a list of trained SVM models.



Figure 1: The interface.

Additionally, a ground-truth of the classification boundary in the dataset is presented in Figure 2, where the green line indicates a rough boundary that separates the orange and blue points. The projections of the support vectors of the first model in the model list forms a donut-like shape.

Relations between the Isomap Result and the Linear Projection Result Figure 3 and 4 shows two selected regions in the 2-D Isomap view. Based on the definition of Isomap the support vectors selected in each region should be close in the high-dimensional space. The corresponding linear projection results also indicate that the locality. Thus the support vectors which stands for the separating hyperplane can be unrolled and projected onto a 2-D plane as the results in the 2-D Isomap view does.

The demo can be accessed at <http://icie.me:8000/static/index.html>. It takes about 10 to 30 seconds to load the data depending on the network speed.



Figure 2: A known classification boundary.

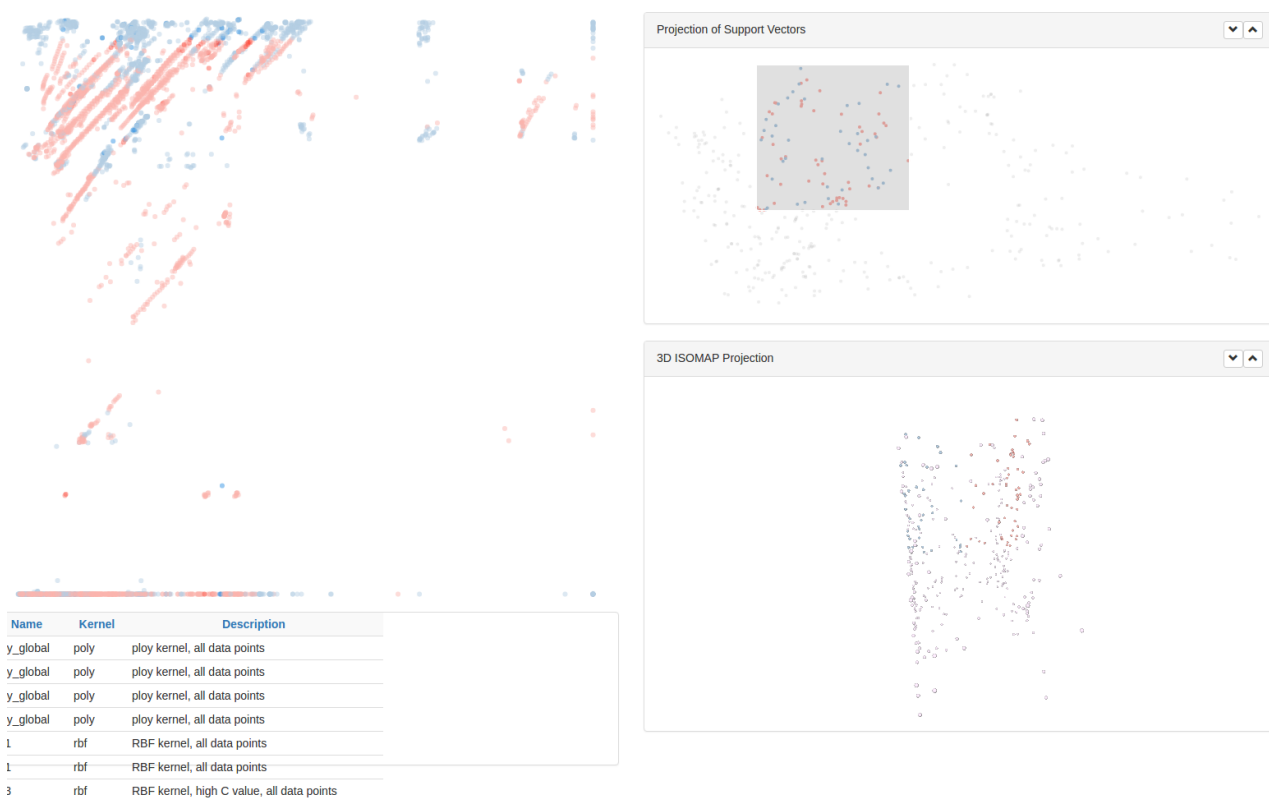


Figure 3: Case 1.

Misc.

Patent Applications

On weekends I was preparing for the the patent applications of the SVM project. Before June I will finish it.

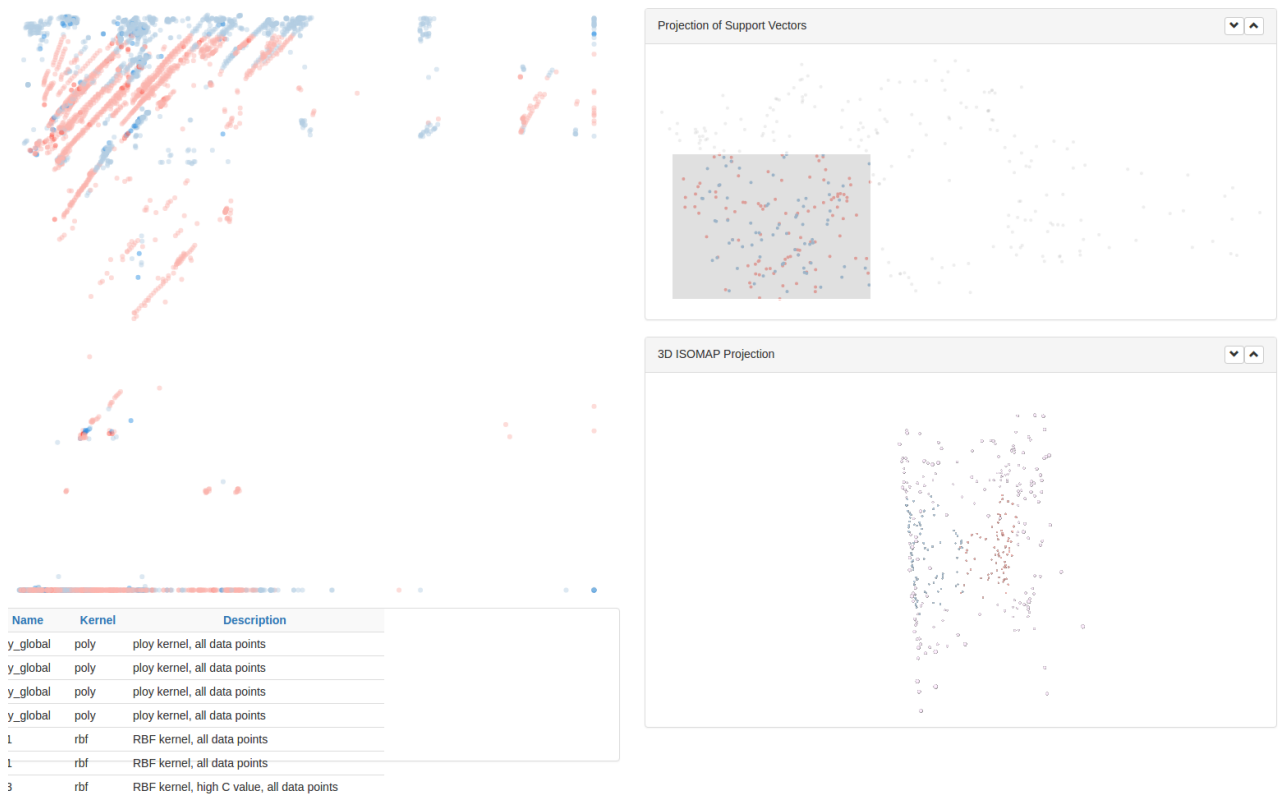


Figure 4: Case 2.

Plan for the Next Week

- Discuss with Prof. Tung about current results and confirm the tasks of visualizing multiple SVM models;
- Start writing an outline of the SVM paper, and
- Write the patent application.